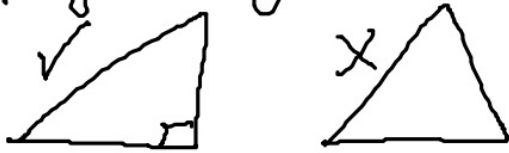


## 8.3 Right Angle Trigonometry

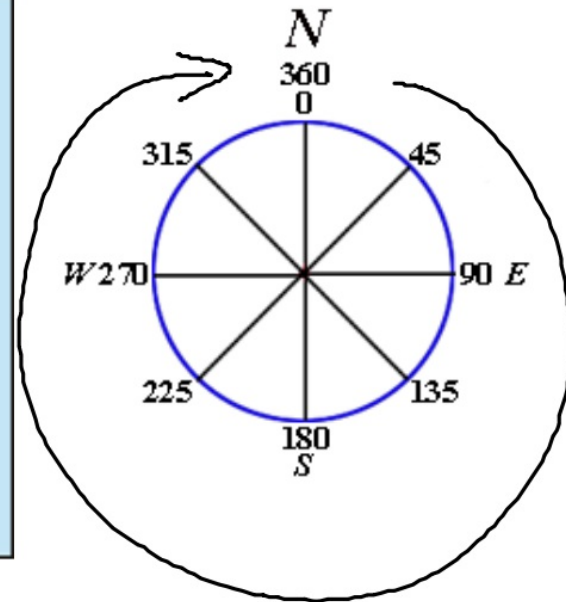
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1/27/12

Right angle =  $90^\circ$  Study of triangles



Ratio - proportion, fractions,



TRIGONOMETRIC

## Trigonometric Ratios

$$\sin = \frac{\text{Opposite}}{\text{Hypotenuse}}$$

$$\cos = \frac{\text{Adjacent}}{\text{Hyp.}}$$

$$\tan = \frac{\text{Opp.}}{\text{Adj.}}$$

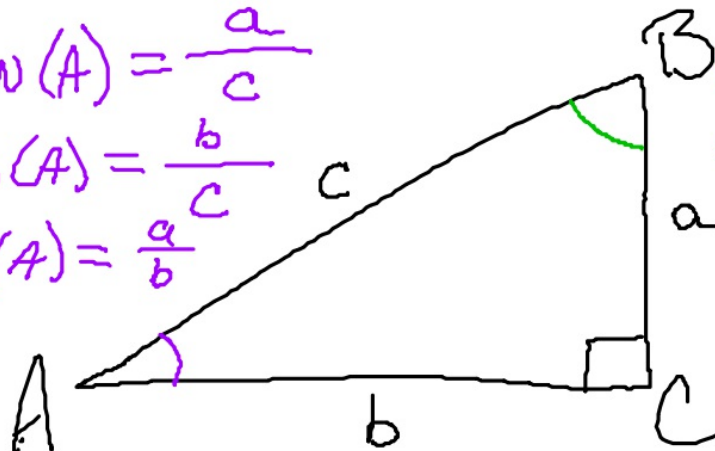
sine  
cosine  
tangent

SOH CAH TOA

$$\sin(A) = \frac{a}{c}$$

$$\cos(A) = \frac{b}{c}$$

$$\tan(A) = \frac{a}{b}$$



$$\sin(B) = \frac{b}{c}$$

$$\cos(B) = \frac{a}{c}$$

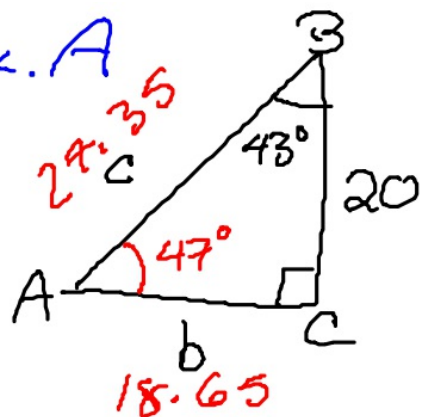
$$\tan(B) = \frac{b}{a}$$

$$\frac{a}{c} = \sin(A) = \cos(B)$$

$$\frac{b}{c} = \cos(A) = \sin(B)$$

$$\tan(A) = \frac{1}{\tan(B)}$$

Ex. A



$$\tan(B) = \frac{b}{20}$$

TOA

$$\tan(43) = \frac{b}{20}$$

$$20 \tan(43) = b = 18.65$$

$$\cos(43) = \frac{20}{c}$$

$$c \cdot \cos(43) = 20$$

$$c = \frac{20}{\cos(43)} = 27.35$$

$$20^2 + 18.65^2 = 27.35^2$$

$$400 + 347.82 = 747.82$$

$$747.82 = 747.82$$

$$a^2 + b^2 = c^2$$

Pythagorean  
Theorem

$\approx$  approx.

$\neq$  D.N.E.

Inv.

1/30/12



$$A = 73^\circ$$

$$B = 90^\circ$$

$$23 \frac{\text{mi}}{\text{hr}}$$

$$t = \text{time (hr)}$$

$$A = 23 \frac{\text{mi}}{\text{hr}} t (\text{hr})$$

$$B = 23 \frac{\text{mi}}{\text{hr}} t (\text{hr})$$

SOH CAHTOA

$$\sin = \frac{O}{H} \quad T = \frac{O}{A}$$

$$C = \frac{A}{H}$$

$$\sin(90) = 1$$

$$\cos(90) = 0$$

$$\underline{X_B = 23t \sin(90)}$$

$$\underline{Y_B = 23t \cos(90)}$$

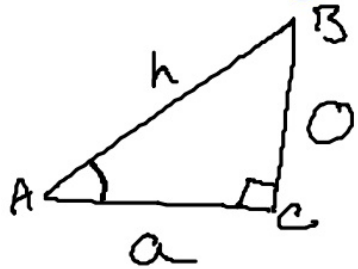
$$\frac{X}{23t} = \sin(73)$$

$$\underline{X_A = 23t \sin(73)}$$

$$\frac{Y}{23t} = \cos(73)$$

$$\underline{X_A = 23t \cos(73)}$$

## Inverse trig. functions



$$\sin(A) = \frac{o}{h}$$

$$\cos(A) = \frac{a}{h}$$

$$\tan(A) = \frac{o}{a}$$

SOHCAHTOA

$$\sin^{-1}\left(\frac{o}{h}\right) = A$$

$$\cos^{-1}\left(\frac{a}{h}\right) = A$$

$$\tan^{-1}\left(\frac{o}{a}\right) = A$$

Inverse

Ex. B

E 2.85 km  
S 6.03 km

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$$\tan^{-1}\left(\frac{2.85}{6.03}\right) = 25.3^\circ$$

$$a^2 + b^2 = c^2$$

$$2.85^2 + 6.03^2 = h^2$$

$$h = \sqrt{5.7 + 36.36}$$

$$h = \sqrt{42.06}$$

$$h = 6.48 \text{ km}$$

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#1-4

SOHCAHTOA



$$+^c \tan(55) = \frac{c+4}{\textcircled{c}} \times c$$

$$c \tan(55) = c + 4$$

Factor

$$c \tan(55) - c = 4$$

$$c(\tan(55) - 1) = 4$$

$$c = \frac{4}{\tan(55) - 1}$$

$$4 / (\tan(55) - 1)$$

## 8.3 Quiz

1/31/12

On a separate sheet of paper, complete p. 445 #10 & 11.

You may use your notes, but you may not ask your neighbor for assistance.